PATENT
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Specification

Hair Iron

Technical Field

The present invention relates to improving the steam cutoff property of a hair iron of V-shaped, hair-sandwiching type used for various perm treatments, where hairs are sandwiched between a pair of openable/closable heating plates that are attached on the opposing surfaces of the hair-sandwiching arms of the hair iron.

The present invention also relates to a hair iron of V-shaped, hair-sandwiching type offering improved steam cutoff property with respect to one void space in the hair-sandwiching arm shielded by shielding members, by means of placing a heating plate with its base end tapered and then tight-fitting a gasket in the applicable tapered void.

The present invention further relates to a hair iron of V-shaped, hair-sandwiching type fitted with a gasket for the purpose of improving the steam cutoff property of the connection area between one void space in the hair-sandwiching arm in which a heat-source plate and a heating plate are stored and the other void space in the hair-sandwiching arm.

Background Technology

Hair irons used for hair straightening include hair irons of V-shaped, grip type having a pair of heating plates attached in a manner facing each other, such as those described in Publications of Unexamined Patent Application Nos. Sho 62-172905, 2000-166634, 2001-137038 and 2002-291517 and Publication of Utility Model Registration No. 3072722. A hair iron of this type has a pair of heating plates attached on the opposing surfaces of V-shaped, hair-sandwiching arms that are maintained by force in opening directions, where the V-shaped, hair-sandwiching arms are operated to sandwich a specified amount of hairs between the pair of heating plates and the heating plates are moved in this condition in the direction of

extending the hairs. This so-called ironing motion removes any frizzles and curls and thereby straightens the hairs. Among hair irons of V-shaped, grip type where a pair of openable/closable heating plates are placed in a manner facing each other, the hair iron disclosed in Publication of Unexamined Patent Application No. 2003-24127 is known where the surface of the heating plate has grooves extending in the longitudinal direction of the arm so as to reduce the effect on the scalp of the steam generated by heated perm solution. When hair irons of this type are used in hair perms, generally perm solution is applied to the hairs. In the case of hair straightening, the temperature of the heating plates is controlled in the range of 100 to 170°C using the selector switch provided on the hair iron.

[Patent Literature 1] Publication of Unexamined Patent Application No. Sho 62-172905
[Patent Literature 2] Publication of Unexamined Patent Application No. 2000-166634
[Patent Literature 3] Publication of Unexamined Patent Application No. 2001-137038
[Patent Literature 4] Publication of Unexamined Patent Application No. 2002-291517
[Patent Literature 5] Publication of Utility Model Registration No. 3072722
[Patent Literature 6] Publication of Unexamined Patent Application No. 2003-24127

With a hair iron of V-shaped, hair-sandwiching type, normally both of the pair of facing heating plates are controlled to an appropriate temperature. Hairs on which perm solution has been applied are then sandwiched between these heating plates and heated. Some of these hair irons store, in a void space formed by shielding members in each V-shaped hair-sandwiching arm, a heating plate, a heat-source plate to heat the heating plate, and also a handy switch and a temperature controller to switch the temperature. On these hair irons, the handy switch is operated to adjust the temperature controller in the range of 100 to 170°C and hairs are sandwiched between the heating plates set to the specified heating temperature, as mentioned above. As hairs are sandwiched, the water content of the perm solution and other chemicals applied to the hairs evaporates instantaneously and high-temperature steam generates. This steam is then released from the heating plates in four directions. As a result, the high-temperature steam is trapped between the heating plates and eventually seeps into the void spaces in V-shaped, hair-sandwiching arms that are shielded by shielding members. This can cause the temperature selector switch, temperature controller, temperature display and

other control devices to suffer electrical damage due to high-temperature steam, and for this reason the aforementioned control devices had to be placed away from the hair-sandwiching arms. Therefore, even when the handy switch on the hair-sandwiching arm is operated to adjust the temperature, it was an extremely cumbersome task for the operator implementing hair perm to confirm the actual temperature every time the temperature was changed, by looking at the temperature controller or temperature display that had to be placed away from the V-shaped, hair-sandwiching arms.

Summary of the Invention

As explained above, conventional hair irons had the problem of high-temperature steam trapped along the periphery of the heating plates and eventually seeping into the void spaces shielded by shielding members via the gaps between the heating plate attached to the V-shaped, hair-sandwiching arm and the shielding members. To prevent this problem, various ways to improve steam cutoff property have been proposed, such as screw-tightening or bonding a gasket or filling calking agent between the heating plate and shielding members. However, filling calking agent makes it difficult to disassemble the hair iron into component parts. Screw-tightening a gasket permits easy assembly, but such attachment structure is vulnerable to large impact and exhibits poor durability. When hairs are sandwiched between the heating plates during the perm, repeated pressurization of the shielding members by the heating plate affects the shielding property between the heating plate and shielding members. This has sometimes led to the problem of high-temperature steam seeping into the void space along the shielding members in a V-shaped, hair-sandwiching arm and contacting the heat-source plate to cause the complex circuitry of the temperature controller to suffer electrical damage. In addition to presenting the risks of fire resulting from such electrical damage, conventional hair irons had to have their temperature controller and temperature display installed away from the V-shaped, hair-sandwiching arms.

The present invention was devised in light of the aforementioned circumstances and the object of the present invention is to provide a safe, easy-to-operate hair iron that eliminates the possibility of electrical damage. This hair iron also permits easy temperature adjustment

because the temperature controller and temperature display can be stored in a void space in the V-shaped, hair-sandwiching arm that is shielded by shielding members, which in turn is made possible by changing the structure of the heating plate base supported by the shielding members in the V-shaped, hair-sandwiching arm and thereby improving the steam cutoff property of the shielded void space in the V-shaped, hair-sandwiching arm.

In order to achieve the aforementioned object, a gasket offering excellent heat resistance and elasticity is fitted between the shielding members and the bases, on the void space side, of the heating plates that are attached in a manner facing each other and maintained on the V-shaped, hair-sandwiching arms (each comprising a pair of right and left shielding members) so that the plates remain open in normal condition, and the gasket is secured using a taper shape provided at each base of the heating plate. This prevents high-temperature steam from seeping into the void space and thereby presents a hair iron of V-shaped, hair-sandwiching type wherein temperature-adjustable heat-source plates, temperature display and temperature controller are stored in the void spaces in the hair-sandwiching arms.

Specifically, the hair iron proposed by the present invention is characterized by the basic structure described below:

(1) A hair iron of V-shaped, hair-sandwiching type, comprising a pair of openable/closable hair-sandwiching arms that each store, in a void space shielded by a pair of right and left shielding members constituting each hair-sandwiching arm, a temperature-adjustable heat-source plate and a heating plate that contacts the heat-source plate and sandwich hairs when the arms are closed, wherein the hair-sandwiching arms are openably/closably connected on one end by a pivot so that the force of a spring provided at a bearing maintains the pair of openable/closable arms in open directions in a normal condition, and the heating plates are affixed in a manner facing each other; the hair iron characterized in that the bases, on the void space side, of the heating plate are tapered and a gasket is fitted in gaps formed by the tapers in order to improve the steam cutoff property of the void space and also facilitate disassembly and assembly.

(2) A hair iron described in (1), characterized in that a gasket is placed in the connection area between one void space shielded by the shielding members of the hair-sandwiching arm in which the heat-source plate and the heating plate are stored, and the other void space also shielded by the shielding members of the hair-sandwiching arm, in order to improve the steam cutoff property of both void spaces.

(3) A hair iron described in (1) or (2), characterized in that a temperature controller and/or a temperature display is placed in the one void space in which the heat-source plate and the heating plate are stored, or in the other void space.

As explained above, the hair iron of V-shaped, hair-sandwiching type proposed by the present invention comprises a pair of right and left shielding members, and the bases of each heating plate stored in the void space shielded by the shielding members are tapered in advance. In the process where the pair of shielding members are assembled and installed from both sides, the convex parts of the shielding members are engaged completely in the tapered voids along the tapered bases of the heating plate, thereby enhancing the airtightness of the void space and thereby improving the steam cutoff property. As a result, the hair iron proposed by the present invention prevents steam from seeping into the void space between the shielding members where the heating plate is attached, even when steam generates from the water content of the perm solution and other chemicals as a result of heating the heating plate during hair ironing. Consequently, this hair iron can completely cut off steam from the void space. Also, a heat-source plate, a temperature controller and a temperature display can also be stored in the void space of the V-shaped arm shielded by the pair of right and left shielding members, which allows the operator to adjust the temperature easily at his or her fingertips. Furthermore, such structure prevents the risks of fire caused by high-temperature steam seeping into the void space and contacting the heat-source plate. Moreover, the operator can easily adjust the temperature by looking at the temperature display near his/her operating hand. Also, simply connecting the pair of shielding members from both sides allows the gasket to align automatically along the tapered bases of the heating plate and completely fit the tapered voids, so the shielding members can be disassembled or assembled from right and left with ease.

The gasket fitted between the heating plate bases and shielding members must be made of a material that withstands high temperatures of well over 100°C. Any material can be used as long as it can act as a buffer, without swelling or dissolving, against the various chemicals contained in the steam of perm solution that generates and comes in contact with the gasket during the treatment. For example, a composition comprising an appropriate blend of natural rubber and synthetic rubber such as polybutadiene rubber, polyisoprene rubber, styrene-butadiene rubber, nitrile rubber, polychloroprene, butyl rubber, Hypalon, EPM, EPDM, urethane rubber or fluorine rubber can be favorably used.

Brief Explanation of the Drawings

[Fig. 1] The heating plate used in the hair iron proposed by the present invention, and the gasket fitted to the heating plate

[Fig. 2] A side view of the gasket-fitted heating plate used in the hair iron proposed by the present invention

[Fig. 3] A cross-section view of the gasket-fitted heating plate used in the hair iron proposed by the present invention (cross-section view taken along line A-A of Fig. 2)

[Fig. 4] A condition before the gasket is fitted to the body of the hair iron proposed by the present invention

[Fig. 5] A condition after the gasket is fitted to the hair iron proposed by the present invention as shown in Fig. 4

[Fig. 6] A side view of the hair-sandwiching arm constituting the hair iron proposed by the present invention

[Fig. 7] A cross-section view taken along line B-B of Fig. 6

[Fig. 8] A perspective view of a conventional hair iron

[Fig. 9] A conventional heating plate in a fitted state

Description of the Symbols

101 Heating plate

102 Gasket

103 Heating plate base

104 Shielding member

105 Tapered heating plate base

106 Grip

107 Hair-sandwiching arm

108 Pivot

109 Gasket

109' Second gasket

110 Affixing part

111 Protective sheet

112 Force spring

113 Temperature controller

114 Temperature display

115 Heat-source plate

116 Shield joint

117 Convex part of shielding member

118 Void space (where a temperature controller is stored)

119 Tapered void

201 Heating plate

202 Gasket

203 Heating plate base

204 Shield

206 Grip

207 Hair-sandwiching arm

208 Pivot

211 Protective sheet

212 Force spring

215 Heat-source plate

216 Shield joint

218 Void space

220 Handy temperature selector switch

221 Screw

Best Mode for Carrying Out the Invention

An embodiment of the present invention is explained according to the drawings.

Fig. 1 shows the heating plate of the V-shaped hair iron proposed by the present invention and the gasket fitted to the heating plate. Fig. 2 is a side view of the gasket-fitted heating plate, while Fig. 3 provides a cross-section view of the gasket-fitted heating plate (cross-section view of the section indicated by the arrows in Fig. 2). Fig. 4 shows a condition before the gasket-fitted heating plate is installed on the iron body, while Fig. 5 shows a condition after the gasket has been fully engaged with the iron body. Fig. 6 shows a side view of the hair-sandwiching arm constituting the hair iron proposed by the present invention, while Fig. 7 shows a cross-section view taken along line B-B of Fig. 6. Fig. 8 is a perspective view of a conventional hair iron of V-shaped, hair-sandwiching arm type, while Fig. 9 is a cross-section view showing how a heating plate is supported on a conventional V-shaped, hair-sandwiching arm.

As shown in Fig. 8, the conventional hair iron of V-shaped, hair-sandwiching arm type has the surface of a shielding member (204) covered by a protective sheet (211), and a pivot (208) of a grip (206) on one end of a hair-sandwiching arm (207) that supports a heating plate (201) by means of the shielding member (204) permits connection of the heating plates (201) openably/closably, with the force of a spring (212) provided at a bearing maintaining the arms in open directions and a handy temperature selector switch (220) permitting temperature change. However, a temperature controller and temperature display (not shown) for heat-source plates had to be positioned far away, because a void space (218) formed in each hair-sandwiching arm (207) has poor steam cutoff property. Even when the temperature was switched using the handy selector switch (220), therefore, the operator had to perform the cumbersome task of checking the distant temperature display controlled by the temperature controller in order to confirm the actual temperature.

Fig. 9 shows a cross-section of the heating plate supported on the same conventional hair iron of V-shaped, hair-sandwiching arm type where a gasket (202) is fitted at a base (203) of the heating plate (201) on the void space (218) side of a heat-source plate (215). The gasket (202) is fitted by means of accurately aligning, at a joint (216), a pair of right and left shielding members (204) from the right and left, and then securely affixing to the heating plate (201) using screws (221). The fitting method is not limited to screw-in, and the gasket can also be fitted by filling calking agent or by bonding. Regardless of the fitting method, however, the gasket (202) invariably changes its position due to impact or a long period of use and creates a gap between the shielding members (204) and the heating plate (201) as a result. This in turns causes high-pressure steam to seep into the void space (218) during the perm, and if a temperature controller or a temperature display is placed in this void space, electrical damage may occur as explained earlier.

As shown in Figs. 1 and 2, the hair iron proposed by the present invention has a gasket (102) fitted beforehand at each base (103) of a heating plate (101) where hairs contact a hair-sandwiching arm (107) (Fig. 2 shows a condition where the gasket (102) is fitted, while Fig. 3 shows a cross-section view taken along line A-A of Fig. 2). A heat-source plate (115) can be temperature-adjusted by means of a temperature controller (113), and the base (103) of the heating plate (101) placed adjacent to the heat-source plate (115) is tapered (105), so that the gasket (102) is fitted in a formed tapered void (119).

The hair iron of V-shaped, hair-sandwiching arm type proposed by the present invention comprises a pair of openable/closable hair-sandwiching arms (107). To constitute the hair-sandwiching arm, a pair of right and left shielding members must be assembled to securely support the heating plate (101). The heating plate (101) adjacent to the heat-source plate (115) has the gasket (102) pre-fitted as shown in Fig. 3, and this gasket-fitted heating plate (101) is securely supported by attaching a pair of right and left shielding members (104) from both sides and then affixing as appropriately a joint (116) of the shielding members (104) using screws, etc. When assembling the pair of right and left shielding members (104) from both sides, the shielding members (104) are moved closer toward the center from the right and left as shown in Fig. 4 (in the directions of the right and left arrows shown at the center of Fig. 4),

in order to form a void space (118). As the shielding members (104) are moved closer toward the center from both sides, a convex part (117) of the inner wall of each shielding member moves toward the center (inward) along the tapered (105) surface of the heating plate base (103), consequently engaging with the tapered void (119) and sealing the void space. The heating plate moves toward the joint (116) of the shielding members (104) (in the direction of the downward arrow shown at the center of Fig. 4). As the convex part (117) of the shielding member moves, the gasket (102) is pressured against the heating plate (101) in all directions of right, left, up and down, and consequently the convex part (117) of the shielding member is completely engaged with the tapered void (119) as shown in Fig. 5, with the gasket (102) securely fitted to the shielding members (104) and thereby improving the steam cutoff property dramatically.

Fig. 6 is a longitudinal cross-section view of one (upper) hair-sandwiching arm (107) of the pair (upper and lower, in the figure) of hair-sandwiching arms each comprising the heating plate (101) as proposed by the V-shaped hair iron body of the present invention. The hair-sandwiching arm (107) securely supports the heating plate (101) in the void space (118) shielded by the shielding members (104), and the end of a grip (106) of the aforementioned arm is openably/closably connected to a pivot (108). The force of a spring (112) provided at a bearing maintains the pair of openable/closable arms in open directions in normal condition, while the pair of heating plates (101) are supported so that they face each other and can sandwich and heat hairs. The hair-sandwiching arm (107) has an appropriate protective sheet, an affixing part (110) and a temperature display (114).

As explained above, the hair iron of V-shaped, hair-sandwiching arm type proposed by the present invention has the structure wherein the V-shaped grips (106) of the pair of openable/closable hair-sandwiching arms (107) are connected circularly movably via the pivotf (108). The spring force holds the heating plates (101) in parallel when the arms (107) of the V-shaped grips (106) are closed, thereby allowing the heating plates to contact with each other over their entire surface as they sandwich the hairs.

The arm (107) of each V-shaped grip (106) has the heat-source plate (115) placed on the back

of the heating plate (101) (on the opposite side of the surface contacting hairs), and a temperature selector switch (120) is used to heat the heating plate (101) located adjacent to the heat-source plate (115) that is temperature-adjusted by the temperature controller (113). The temperature is then shown on the temperature display (114).

The hair iron of V-shaped, hair-sandwiching arm type proposed by the present invention comprises the pair of right and left shielding members (104) that are assembled from the right and left as indicated by the arrows in Fig. 5, and these pair of shielding members create a void space in which the heat-source plate (115) and the heating plate (101) are stored, and another void space on the grip (106) side. In Fig. 6, the temperature controller (113) is positioned in the grip-side void space. Since the present invention provides improved steam cutoff property by way of tight-fitting a gasket, the temperature controller can also be placed in the void space (118) on the heating plate (101) side.

It is also effective to position a second gasket (109') at the joint (116) of the pair of shielding members (104) connecting the void space in which the heat-source plate and the heating plate (101) are stored and the void space on the grip side, in order to further improve the steam cutoff property with respect to both void spaces. In other words, by placing the second gasket (109') as shown in Fig. 7 that is a cross-section view taken along line B-B of Fig. 6, high-temperature steam around the heating plate (101) can be cut off and steam can be completely cut off from the void space in which the heat-source plate and the heating plate are stored as well as from the void space on the grip side.

The aforementioned hair iron proposed by the present invention is used in the same manner as any conventional hair iron of V-shaped, hair-sandwiching arm type is used. Specifically, perm solution is applied to hairs, the heating plates (101) are heated to a specified temperature, and then the V-shaped grips (106) are operated to sandwich a specified amount of hairs between the heating plates (101). At this time, high-temperature steam generates as the perm solution on the hairs evaporates. This steam is released from the heating plates (101) in four directions. However, due to the gasket (102), which allows the heating plate base (103) and the convex part (117) of each shielding member to engage securely and completely in the tapered void

along the taper (105) when the pair of right and left shielding members (104) are assembled from the right and left, the steam is completely cut off from the formed void space. Therefore, the heat-source plate (115) and the temperature controller (113) stored in the void space on the grip side or the heating plate side can operate safely and stably.

Industrial Field of Application

As explained above, the hair iron proposed by the present invention allows a gasket to be securely fitted to the shielding members by utilizing the tapered shapes provided at the bases of heating plates attached on the opposing surfaces of the pair of openable/closable arms that constitute the V-shaped hair iron. Also, the elasticity of the heat-resistant, elastic gasket material is maximally utilized to completely prevent seeping in of steam of perm solution that generates during the perm. Also, a temperature controller and a temperature display can be provided near the operating hand, in addition to a temperature selector device, so that the operator can control the temperature at his or her fingertips and check the actual temperature with ease, which significantly reduces the time and trouble of perm treatment.